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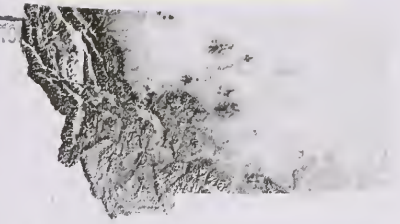
Montana GIS News



Montana GIS News Fall Edition 1999

National Hydrography Dataset

by: Duane Anderson

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes,streams, rivers, springs and wells(see http://nhd.usgs.gov). Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of water-related data in upstream and downstream order.

In Montana, the precursors to NHD are from 2 sources. In Eastern Montana, the NHD is based upon the content of USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the Environmental Protection Agency(EPA) Reach File Version 3 (RF3). The NHD supersedes DLG and RF3 by incorporating them, not by replacing them. Users of DLG or RF3 will find the NHD both familiar and greatly expanded and refined. In Western Montana, the NHD is based upon work done in the Pacific Northwest in the early 90's. This data, known as the Pacific Northwest Reach File, was developed for Columbia Basin specific applications and has been recognized by EPA and the US Geological Survey (USGS) as the official version of

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Mapping Fire and Fuels Characteristics Using Remote Sensing and Biophysical Modeling for Operational Fire Management

by: Carl A. Seielstad and LLoyd P. Queen

Scientists at the University of Montana (UM) School of Forestry's Remote Sensing Laboratory are currently collaborating with the US Forest Service(USFS), US Geological Survey(USGS), University of Idaho, and The Sampson Group to develop innovative fire and fuels mapping methods for use in operational fire management. National Aeronautic Space Administration has recently funded the collaboration through its Remote Sensing Applications Research in Agriculture, Forestry, and Range Resource Management program. The project, headed by Robert Keane of the USFS Intermountain Fire Sciences Laboratory in Missoula, proposes to provide a simple but specialized set of methods and standards to create spatial fuels layers for fire behavior and fire effects prediction systems and hazard and risk assessment. Traditional optical remote sensing technologies are being integrated with new active remote sensing methods and biophysical gradient modeling to meet these objectives.

The need for accurate, spatially explicit fuels data has become increasingly apparent as land management agencies embrace prescribed fire as a viable treatment alternative for much of our public land. These data sets will be used to generate and implement fire policy at the local, regional and national levels and to drive the complex computer models that allow prediction of fire behavior, smoke emissions, and fire effects. Remote sensing will inevitably be an important tool for fuel map development because it can rapidly and cheaply provide detailed information for large areas. However, current fuels mapping efforts that utilize remote sensing are limited at resolutions appropriate for most modeling exercises because the sensors are unable to collect critical

Mapping Fire continued on page 3

PLEASE RETURN

MFWP GIS Coordination Moves to Helena

by: Janet Hess-Herbert

In April, coordination of the Montana Fish, Wildlife and Parks(MFWP) GIS Program moved to Helena. Janet Hess-Herbert, the MFWP GIS Coordinator, has relocated to an office at the Natural Resource Information System (NRIS). The move will allow for better service to the agency and closer involvement of MFWP with other GIS activities in the state. Staff programmers Lydia Bailey and Jeff Hutten have remained in Kalispell and will continue to provide GIS services to the department; an additional part-time staff will be added in Kalispell, a full-time Fisheries programmer will be joining Hess-Herbert at the NRIS office and NRIS staff will also be used to fill MFWP GIS requests. Bailey has recently received her ArcView instructor certification and will be able to better serve the 30+ ArcView users in the department. ♦

New NRIS GIS Coordinator Arrives

Ted Chase joined the NRIS staff June 24, 1999 as the GIS Coordinator. Ted comes from Denver, CO where he worked for 10 years as a GIS Manager for QC Data Inc. At QC Data, Ted supervised up to 120 GIS programmers and technicians working in the U.S. and Canada on a wide range of projects. Ted's duties at NRIS include GIS project management, and coordinating with organizations that generate and use GIS natural resource information.♦

Ted Chase, GIS Coordinator

Hydrography - continued from page 1

1:100,000 hydrography for Western Montana.

When the NHD is complete, Montana will finally have an integrated, consistent, Statewide 1:100,000 hydrography coverage which will be fully networked and routable. This file will be used for data such as the Department of Environmental Quality's Total Maximum Daily Load list, Fish Wildlife and Park's Montana River's Information System, and other stream based data systems, allowing for the development of a powerful stream based data reporting, querying, and mapping system.

Visual pass work is complete for Montana and the data is in the final stages of conversion at the National headquarters for the project. Test data will be delivered sometime in August with the completion of the product statewide anticipated by the end of 1999.♦

Don't Duck Metadata Mini Grant Available

The Natural Resource Information System (NRIS) recently submitted a "Don't Duck Metadata" proposal to the Federal Geographic Data Committee (FGDC) on behalf of the Interagency Technical Working Group (ITWG), the Montana Local Government GIS Coalition (MLGGC), and the Montana Geographic Information Council (MGIC). Montana received an award & will now award four $3000 "Mini Grants" to agencies or organizations that plan to create FGDC-compliant metadata in the next year. The application form is available on the ITWG website at http://www.forestry.umt.edu/itwg/new/default.htm. Alternately, you can contact Kris Larson at 406-444-5691 or klarson@state.mt.us — to get a copy of the form, or if you have any questions about the grant. **THE DEADLINE FOR MINI-GRANT SUBMISSIONS IS OCTOBER 13, 1999.**

As part of the same proposal, the state will also acquire a traveling computer lab. Any GIS practitioner affiliated with ITWG, MLGGC, or MGIC may use the lab if they agree to include a section on metadata as part of their GIS instruction. The Montana State Library will provide "canned" metadata training materials. ArcView will be available on all of the computers. ♦

DON'T DUCK METADATA

THE 2000 INTERMOUNTAIN GIS USERS' CONFERENCE

May 1 - 4, 2000
Cavanaugh's Inn at Kalispell Center,
Kalispell, Montana

CALL FOR PAPERS

The Montana GIS Users' Group and the Northern Rockies Chapter of URISA invite presentation of papers, electronic demonstrations, panel discussions and poster entries for The Annual Intermountain GIS Users' Conference to be held in Kalispell, Montana, May 1 - 4, 2000. The conference theme this year is "**The GeoSpatial New West, Kalispell 2000**", emphasizing how GIS technology is being used to manage and guide our region during this age of rapid growth and evolution today and into the next millenium.

The Intermountain GIS Users' Conference attracts a wide variety of GIS users from federal, state, and local governments, as well as from private organizations. Concurrent tracks will focus on local government, natural resources, Native American issues, remote sensing, new technology, education, public health & safety, and a vendor track. Topics include, but are not limited to:

- GIS in Rural Communities
- Remote Sensing & Photogrammetry
- Permitting Applications
- Landuse Mapping
- Law Enforcement/Crime Analysis
- Ecosystem Management
- Habitat Delineation/Modeling
- GIS Database Design & Management
- Internet & Data Repositories
- Precision Agriculture
- Fire Management
- Data Visualization
- Water Resources
- Data Standards
- GIS and the User Interface
- Local Government
- Cadastral Mapping
- Census 2000
- E911 Systems
- Metadata
- Native American Issues
- Planning and Zoning
- Education/K-12
- GPS & Surveying
- New Technology
- Natural Resources
- GIS and Business
- Appraisal & Assessment
- Recreation
- Public Works

Abstracts are required for presentations (including demonstrations and panel discussion topics) and posters. Abstracts should be single spaced and 200 words or less. They should include the title of the proposed presentation and a summarization of the presentation's or poster's content. Panel discussion abstracts should also specify the subject area to be covered, with each panel members' name, title, and organizational affiliation.

For those submitting presentations, you must also complete Section 1 of the Submission Form in addition to an abstract. For those submitting poster entries, you must complete Section 2 of the Submission Form. Posters should also be submitted in .pdf format and winners will be posted on the Internet. The Submission Form and abstracts must be postmarked or faxed on or before **February 14, 2000.** Return the forms to:

Margie Lubinski
Lolo National Forest, Geometronics
Building 24, Fort Missoula
Missoula, MT 59804
Phone: 406-329-3743
Fax: 406-329-3795

Submit abstracts on an IBM 3.5" diskette as an ASCII text file to the address above or via email to :
mlubinsk/r1_lolo@fs.fed.us
("r one")

Notification of acceptance will be on or before March 15, 2000. All persons submitting a presentation or poster entry will be expected to register for the conference. Check the conference web site at http://www.umt.gis.edu/gisconf/ for program schedule and additional conference details as they become available. For general information about the conference contact Gretchen Burton at 406-994-6921 or burton@guava.giac.montana.edu or Nickie Duff at nduff@ram.powereng.com. Additional information is also available from:

Margie Lubinski, Track Coordinator
mlubinsk/r1_lolo@fs.fed.us

Hans Zuuring, Posters Chair
hrz@forestry.umt.edu

Lydia Bailey, Facilities Chair
mrisfwp@digisys.net

SUBMISSION FORM

Name _____ Are you a student? ____Yes____No

Organization _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ Email _____

Section 1 – Presentations

TYPE OF PRESENTATION:
❑ Paper ❑ Electronic Demonstration ❑ Panel Discussion

(Presentations should be 20-25 minutes long. If you need additional time, please let us know.)

INTENDED AUDIENCE:
❑ Novice GIS User ❑ Experienced User ❑ Manager ❑ Other _____

CONCURRENT TRACK:
❑ Natural Resources ❑ Local Government ❑ New Technology ❑ Native American Issues
❑ Education ❑ Remote Sensing ❑ Vendor ❑ Public Health & Safety
❑ Other _____

AUDIO VISUAL NEEDS (Check all that apply):
❑ Slide Projector ❑ Overhead Projector ❑ Data Projector* ❑ Flip Chart/Easel
❑ Other (please specify) _____
*(If you require a data projector you must supply your own computer.)

Section 2 – Poster Entries

DEFINITION OF CATEGORIES (Submissions by students are judged separately):
Poster Display – Generally more text intensive and illustrating specific projects or a process, to be judged on graphic design.
Cartographic Product – Strictly map products, to be judged on cartographic design.
Internet Mapping Application – Web-based GIS applications or web sites featuring maps and GIS products, to be judged on web design and application effectiveness.

TYPE OF ENTRY:
❑ Poster Display ❑ Cartographic Product ❑ Internet Mapping Application**

**FOR INTERNET MAPPING APPLICATIONS ONLY:
Do you require an Internet connection: ❑ Yes ❑ No
What type of computer are you bringing: ❑ Portable PC/Notebook Style ❑ Monitor & Tower

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GIS Toolbox and Curriculum Guide Nears Completion

by: Gretchen Burton

The Physical GIS Toolbox is now in the final stages of its development and will be ready for distribution in the fall of 1999, complete with a teacher's curriculum guide. The idea for a curriculum arose last fall, when the Montana GIS Users' Group Education Subcommittee met with the Montana Natural History Center (MNHC) to work on a plan to distribute the toolbox. The MNHC houses and distributes several toolboxes for organizations around the state and they have agreed to pilot ours for a year. They had many valuable suggestions on how to increase the appeal of our toolbox to teachers, one being to include a curriculum for each of the items. As a result of those discussions, the Education Subcommittee has been working with two teachers in the Butte area on curriculum development. Each item or group of items in the toolbox, of which there are now 25, will have a corresponding lesson plan. All the lesson plans will be compiled into one document, in a loose-leaf binder format, so that teachers can readily determine such particulars as lesson duration, appropriate grade level, student objectives, required materials, advanced preparation, additional activities, etc., without having extensive background knowledge about the items.

The curriculum and the toolbox contents are divided into three sections:

Section 1 - Map Reading and Interpretation
Section 2 - Using Global Positioning Systems
Section 3 - Using GIS

We also have a few posters in the box that teachers can temporarily display for "atmosphere" in the classroom. The lesson plans are divided between the secondary and upper elementary grade levels, which will lend itself well to a division into two boxes; we will explore this option further with the MNHC when the box is ready for distribution. After the curriculum guide is compiled, we will ship the toolbox to the MNHC where it will be piloted and evaluated, in time for the 1999-2000 school year.

We still need a list of contacts (which will be placed in the box) from around the state of people whom the teachers can contact for more information or assistance. Anyone with a working knowledge of GIS, GPS or mapping who is interested in lending a hand to their local area students can contact Margie Lubinski (mlubinsk/r1_lolo@fs.fed.us) to be included on this list. Contact Mike Frankovich (franko@montana.com) or Gretchen Burton (burton@guava.giac.montana.edu) for more information about the GIS Toolbox.

Again - thanks to all who donated generously both with time and materials. You have made this effort a great success! ♦

Mapping Fire continued from Page 1

information from within and beneath tree canopies. A new generation of sensors, lidars (light detection and ranging), promise to deliver the necessary structural data from the canopy and the forest floor.

Lidar is an active remote sensing technique that can provide precise measurements of canopy top height, vertical canopy distribution, surface roughness, and ground surface topographic elevation. A lidar uses light emissions to measure ranges between itself and a reflective surface. Airborne or spaceborne lidar instruments emit pulses of electro-magnetic (typically near-infrared) radiation toward the earth and collect the backscatter using nanosecond-resolution clocks to time the roundtrip propagation of each pulse. The speed of light (c) is used to calculate the distance from the sensor to the target ($\Delta T=2Z/c$ where T is time and Z is distance). Earth surface structural parameters like slope and vegetation height are determined by analysis of the intensity and the temporal distribution of backscatter radiation collected from each pulse.

Lidars, in conjunction with existing multispectral sensors, are expected to provide accurate characterizations of forest crown, transition, and surface fuels. At the UM, we are attempting to establish relationships between multiple return lidar data and fuels by modeling fuel-lidar interactions and by comparing actual lidar data with detailed structural information. It is expected that the results from this study will lead to an explicit methodology for generation of accurate fuels maps and will provide the framework for generation of the necessary inputs to a new generation of fire behavior, effects, and emissions models. This work supports and is supported by current fire detection and fire potential research that is ongoing at the UM.

GIS Events

September 27,1999, Montana Association of Counties, Outlaw Inn, Kalispell MT. Contact- Gretchen Burton, burton@guava.giac.montana.edu, 406-994-6921

September 29,1999 MLGGC, Outlaw Inn, Kalispell, MT. Contact- Gretchen Burton, burton@guava.giac.montana.edu, 406-994-6921

October 13, 1999 Montana Inter-Agency Technical Working Group, Condon, MT, Contact. Steve Henry, steve_s_henry@fws.gov, 406-538-8706x269

October 14, 1999 Montana GIS Users' Group, Contact: Margie Lubinski, Lubinski_Marjorie_G/rl_lolo@fs.fed.us, 406-329-3743

November 19,1999, GIS Day – Nation-wide, Contact. Velda Welchfor activities in Helena, vwelch@nris.state.mt.us, 406-444-3345 ;Ken Wall for activities in Missoula, kwall@GeoData-MT.com, 406-721-8865; and Steve Henry for internet activities, steve_s_henry@fws.gov, 406-538-8706x269

May 1-4,2000,Intermountain GIS Conference, Kalispell, MT. Contact: Margie Lubinski, Lubinski_Marjorie_G/rl_lolo@fs.fed.us, 406-329-3743

A greyscale shaded relief image of a portion of the Greater Yellowstone Ecological Assessment Area for which the NRCS and USFS are developing an erosion modeling application.

Montana GIS Users' Group
Montana State Library
Natural Resource Information System
PO Box 201800
Helena, MT 59620-1800